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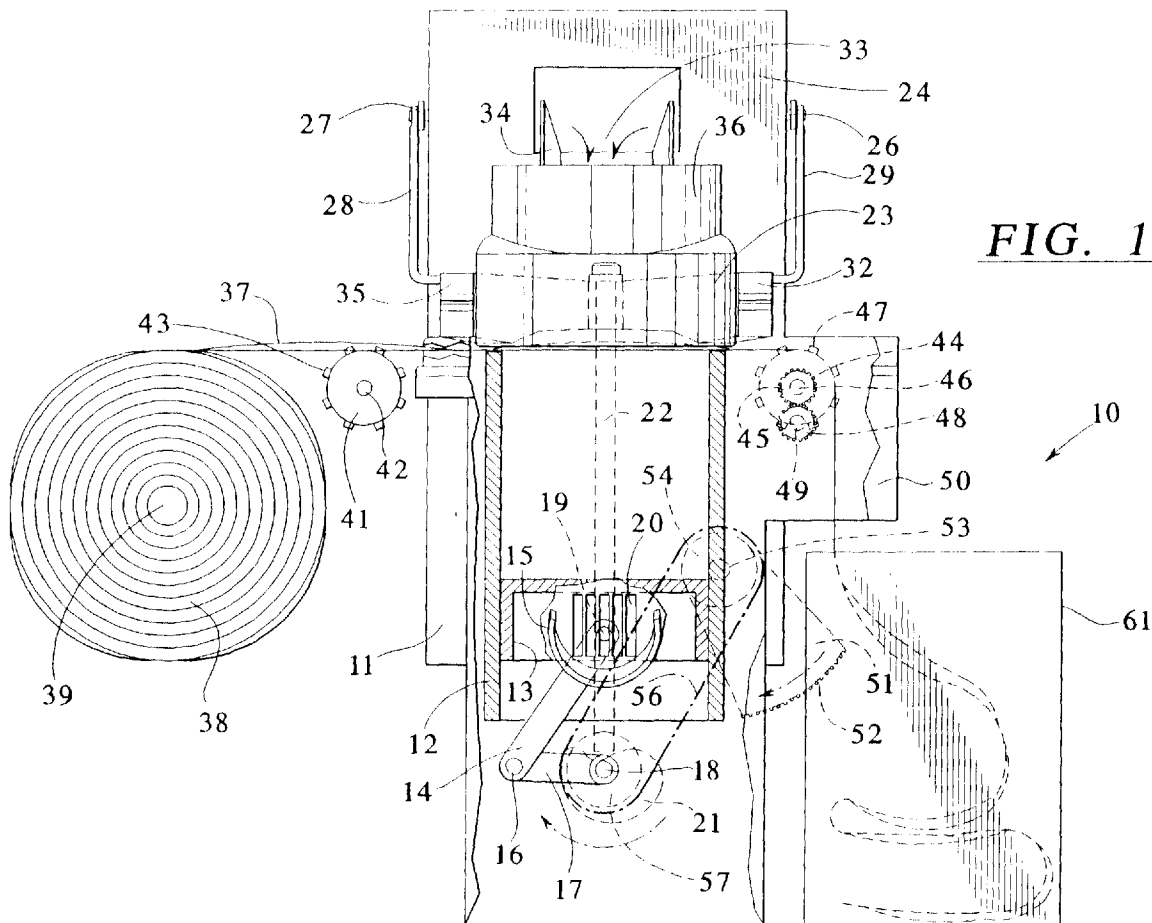
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(54) **Brew system for beverage packets: single or linked together**

(57) A beverage brewer (10) with tape (37) formed of two layers of paper between which are packets of coffee. The tape (37) has perforations along each edge and

sprockets (44) intermittently drive the tape (37) so as to place fresh coffee into the brewer and to remove the used coffee from the brewing chamber.



Description**BACKGROUND OF THE INVENTION****Field of the Invention**

This invention relates to beverage brewing machines and in particular to an improved tape in which the grounds are encapsulated and separated into individual brewing pallets.

Description of the Related Art

Beverage brewing machines such as coffee brewers are known such as my Patent No. 4,903,586 which includes a strip-shaped filter and has upper and lower brewing chambers with a piston mounted in the lower brewing chamber for agitating and drawing the brewed beverage through the coffee grounds and filter. See also patent 4,426,919 which has strips formed with a lower porous layer and upper water proof layer with spaced packets of coffee therebetween and with annular seals in the top layer in which is mounted a porous layer. See also Patent Nos. 5,309,820, 5,337,653, 4,936,199, 5,353,692, 3,208,369, 3,143,954 and 3,122,988.

Summary of the Invention

The present invention relates to a novel coffee brewer and a novel tape in which coffee or other beverage ingredient is encapsulated between two pervious layers such as paper such that the encapsulated portion can be individually advanced into a brewing machine to allow beverage to be brewed after which the upper and lower portion of the brewing machine separate and the tape with the spent coffee grounds is removed from the brewing chamber and a new portion of the tape with the new coffee grounds are inserted into the machine.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

Brief Description of the Drawings

FIG. 1 is a front plan view partially in section with the upper and lower brewing chamber sealed together;

FIG. 2 is a front plan view partially in section of the brewing machine with the upper and lower brewing chamber separated; and

FIG. 3 is a perspective view illustrating the encapsulated tape.

Detailed Description of the Preferred embodiments

FIGS. 1 and 2 illustrate a beverage brewer 10 which has a housing 11 that supports a lower brewing chamber 12 of cylindrical shape in which a piston 13 is movably mounted and is connected by a wrist pin 19 to a link 14 that is pivoted by pin 16 to an arm 17 that is driven by a shaft 18 to which a suitable driving motor, not shown, is attached. The lower brewing chamber 12 is formed with coffee discharge slots 20 so that the coffee from the lower brewing chamber can pass to a spout 15 where it is received in a cup or other container, not shown.

An upper brewing chamber 23 is movably mounted relative to the lower brewing chamber 12 in a manner as shown and described in my prior patent 4,903,586. A rod 22 is supported for a movable motion and has a lower end that engages a cam 21 mounted on shaft 18. The upper end of the shaft 22 is connected to a yoke having arms 28 and 29 which are pivotally connected by pins 26 and 27 to the stationary water container 24 of the housing 11 and the arms 28 and 29 are pivotally connected by connectors 32 and 35 to the upper brewing chamber 23 so as the shaft 22 moves upwardly and downwardly in response to the cam 21, the upper brewing chamber 23 separates from the lower brewing chamber 12. A funnel 36 is connected to the upper portion of the upper brewing chamber 23 and a spout 34 periodically discharges water through an opening 33 from the water container 24 into the upper brewing chamber 23 through the spout 34. A shaft 39 is fixedly mounted relative to the housing 11 and supports a reel 38 of tape of encapsulated coffee mounted between two porous layers of paper. The tape 37 passes over sprockets 41 and 41a mounted on a supporting shaft 42 which is supported by the housing 11 for rotational motion and the sprockets 41 and 41a have extensions 43 and 43a which are aligned with perforations 63, 66 and 63a, 66a in the tape 37. The tape 37 passes through the brewing chamber between the upper brewing chamber 23 and the lower brewing chamber 12 and then passes over a second set of sprockets 44 which have projections 47 which are received in the perforations 63, 66 and 63a and 66 and 66a. The sprockets 44 are mounted on a shaft 46 and the shaft 46 is rotatably supported by the housing 11 on the opposite side of the machine to that on which the shaft 42 is supported. A gear 45 is non-rotatably attached to the shaft 46 and sprockets 44 and is in mesh with the gear 48 which is rotatably mounted on a shaft 49 supported by the housing 11.

A segment gear 51 with teeth 52 is non-rotatably mounted on a shaft 53 which carries a pulley 54 and is supported by the housing. A belt 56 passes over the pulley 54 and its lower end passes over a pulley 57 which is non-rotatably mounted on the shaft 18. The tape 37 passes over the sprockets 44 and through a guard 50 of the machine 10 and is received in a receptacle 61 which receives the used tape.

As shown in FIG. 3, the tape 37 comprises a lower

pervious layer 62 which might be of paper. Coffee grounds 67 are attached to the lower layer 62 and an upper pervious layer 64 is attached to the lower layer 62 over the coffee grounds 67 and the upper and lower layers 62 and 64 are sealed together by adhesive or other means. Perforations 66 and 68a in the layer 64 are aligned with the perforations 63 and 63a in the lower layer 62 so that the sprockets 41 and 44 drive the tape with the projections 43 and 47 which extend through the openings 63 and 66. The coffee 67 is spaced along the tapes 62 and 64 with a spacing interval 68 therebetween such that one of the encapsulated coffee pad 67 will be within the brewing machine after each brewing cycle.

In operation, initially fresh coffee is in the brewing chamber and when the driving motor of the machine is actuated it drives shaft 18. Hot water is inserted into the upper brewing chamber from the hot water tank 24 through the spout 34 and funnel 36 and as the motor 18 shaft continues to turn, the piston 13 moves upwardly to force air through the tape 37 and coffee grounds 67 and then sucks the hot water from the upper brewing chamber 23 into the lower brewing chamber 12 through the coffee grounds and tape 37 so as to brew the coffee. The piston 13 continues its downward motion until the top of the piston 13 is below the slots 20 and the lower brewing chamber so that the coffee then runs through the slots 20 into the spout 15 and into a suitable receptacle, as for example a cup. Then cam 21 moves shaft 22 to separate the upper brewing chamber 23 from the lower brewing chamber 12 as shown in FIG. 2. Then, the teeth 52 of the segment gear 51 engage the teeth of the gear 48 so as to turn the sprockets 44 to drive the tape 37 so as to remove the used coffee grounds 67 and the tape 37 out of the brewing chamber so that it passes downwardly over the sprocket 44 into the receptacle 61. An unused packet 67 on the tape 37 will be moved into the brewing chamber for the next cycle. Further movement of the shaft 18 causes the push rod 22 to move downwardly so as to seal the upper brewing chamber 23 to the lower brewing chamber 12. Then the motor stops and the brewer is ready for another brewing cycle.

It is seen that this invention provides a new and novel beverage brewer which includes a permeable tape formed of two layers of permeable material such as paper between which coffee packet 67 are mounted. The tape is formed with a sprocket holes and passes over suitable sprockets which periodically drives the tape so as to remove the used coffee packets out of the brewing chamber and to move a new unused coffee packet into the machine.

Although the invention has been described with respect to preferred embodiments, it is not to be so limited as changes and modifications can be made which are within the full intended scope of the invention as defined by the appended claims.

Claims

1. In a beverage brewer having upper and lower brewing chambers which are moved apart and are periodically sealed together, a tape formed of first and second impervious layers which are joined together with packets of coffee at spaced intervals between the layers, said tape formed with perforations along at least one edge, and sprocket means engageable with said tape, and driving means connected to said sprocket means to intermittently drive the tape when the upper and lower brewing chambers are spaced apart.
2. In a beverage brewer according to claim 1 wherein at least one of said first and second layers is formed of paper.
3. In a beverage brewer according to claim 1 wherein said first and second layers are formed of paper.
4. In a beverage brewer according to claim 1 wherein perforations are formed along both edges of said tape and said sprocket means engages and drives said tape through said perforations along both edges.
5. In a beverage brewer according to claim 1 wherein said tape is formed into a roll, and a shaft extends through said roll, and said shaft is mounted adjacent said upper and lower brewing chambers.

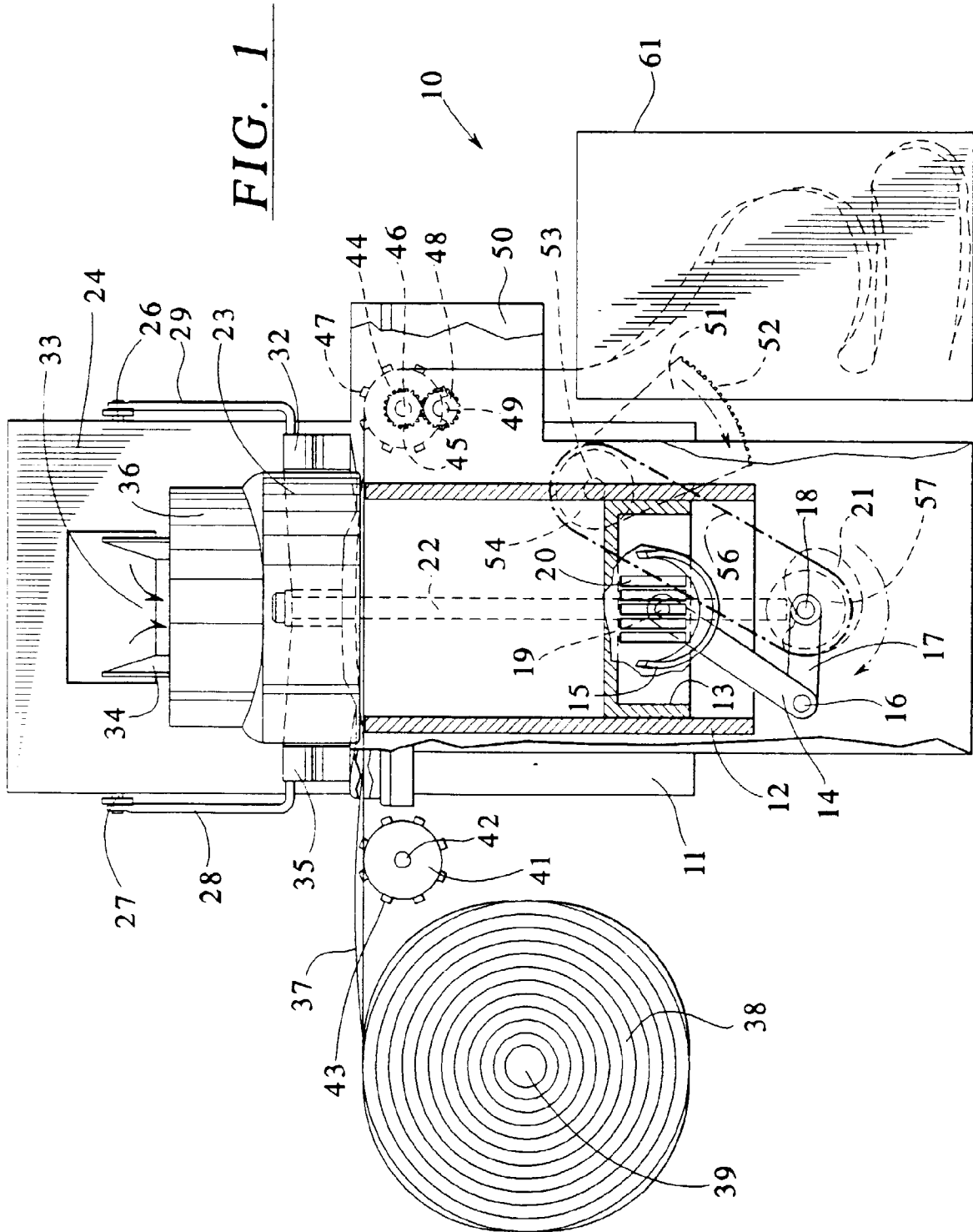
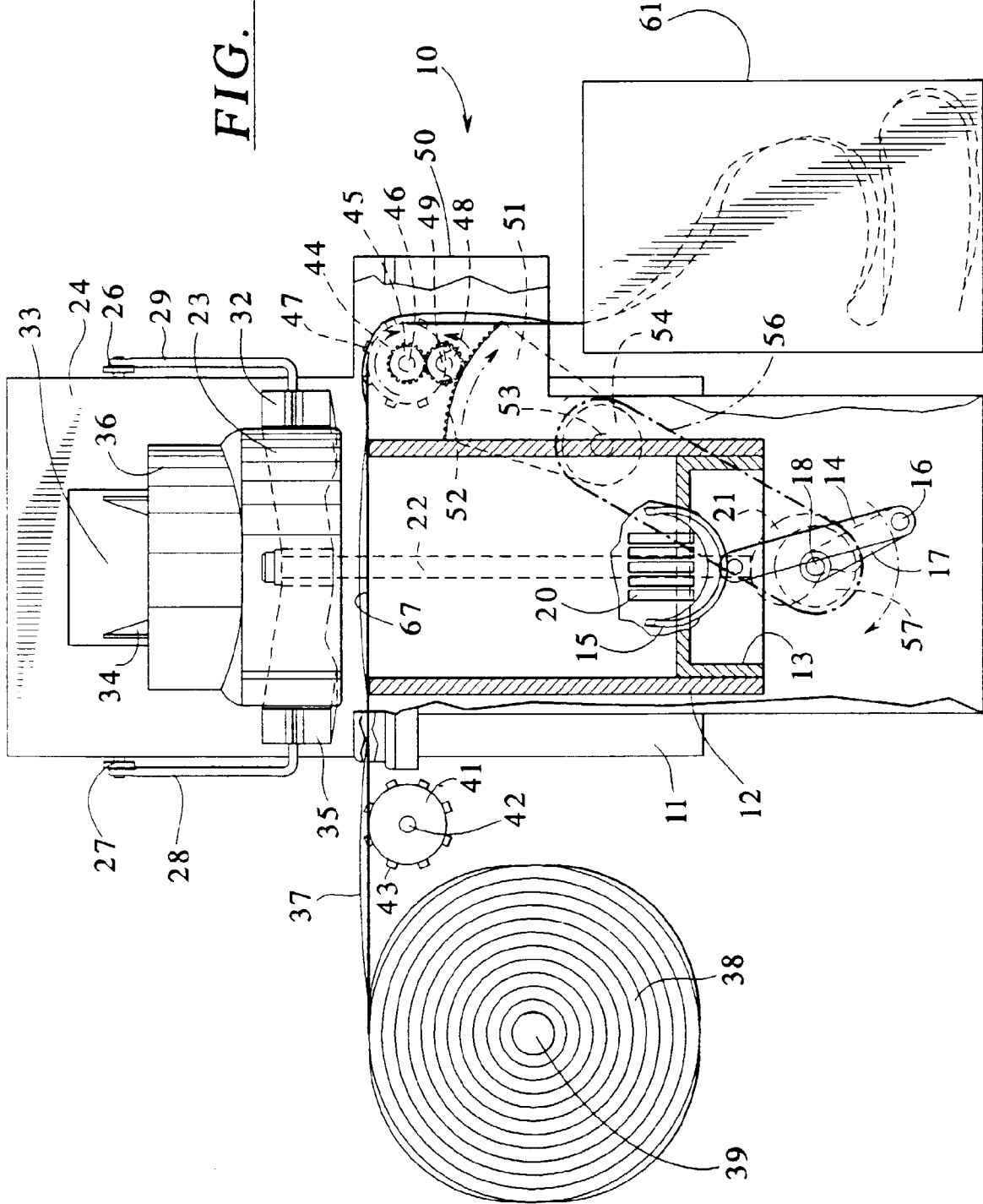


FIG. 2



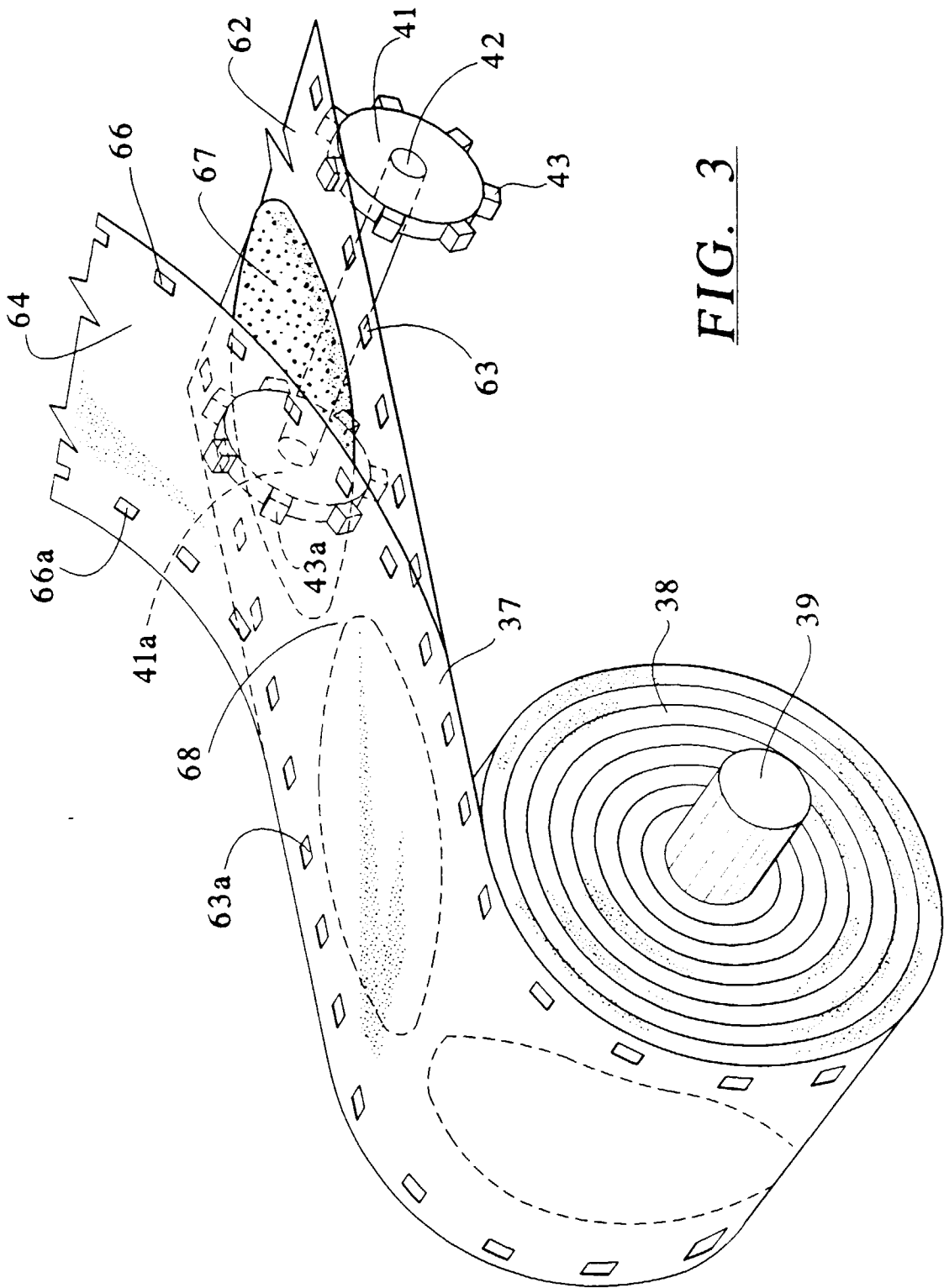


FIG. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 1907

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 3 209 676 A (ZIMMERMANN) * column 1, line 68 - column 5, line 42; figures *	1-5	A47J31/40
X	--- GB 2 288 972 A (JEANS) * page 1, line 13 - page 4, line 28; figures *	1,4,5	
X	--- DE 43 24 468 C (COSMEC S.R.L.) * column 3, line 50 - column 6, line 63; figures *	1	
A	--- US 4 134 332 A (MERMAN) * column 4, line 42 - line 60; figure 1 *	1	
A	--- WO 88 08268 A (GENERAL DISPENSING SYSTEMS LTD) * page 4, paragraph 4 - page 5, paragraph 1; figures 4,5 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 July 1997	Examiner Bodart, P
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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